

DECKER COAL #8

BIG HORN COUNTY

The Decker Coal #8 air monitoring site is located approximately 4 miles northeast of Decker at 45°03'19" N and 106°48'17" W (Site No. 2 on Map II-1). Elevation at the site is 3,480 feet. The site was established by Decker Coal Company to monitor concentrations of particulates in the air around the mine.

Wind parameters have been monitored long enough to give a good picture of the wind resource in the area. Wind data from December 1, 1980, through May 31, 1982, were available for analysis. The data set consists of hourly averages of wind speed and wind direction, manually reduced from stripchart records, at an anemometer height of 10 meters. Data recovery was excellent, ranging from 85.5 percent in January to 100.0 percent in February, September, and October. Overall data recovery was 95.9 percent.

Average annual wind speed at this site was 9.4 miles per hour. Monthly wind speeds varied from 6.6 miles per hour in August to 11.8 miles per hour in May.

Average annual wind power was 106.0 watts/m². Monthly average wind power ranged from 37.0 watts/m² in September to 161.4 watts/m² in May.

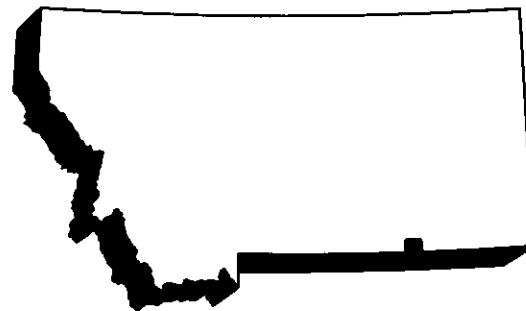


Table IV - 4

Monthly Wind Speed Distribution

BIG HORN COUNTY - DECKER COAL #8

12/01/80 - 05/31/82

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM	0.0	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	CALM
0.1-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1- 0.4
1.1-2.0	0.0	0.5	0.0	0.0	0.0	0.0	0.7	0.3	0.0	0.0	0.0	0.0	0.1	0.5- 0.9
S 2.1-3.0	0.2	0.1	0.2	0.0	0.1	0.2	0.5	1.0	0.8	0.0	0.0	0.0	0.2	1.0- 1.3
P 3.1-4.0	4.7	3.0	3.2	1.0	0.8	4.0	5.9	12.0	9.9	0.4	0.3	0.2	3.2	1.4- 1.8
E 4.1-5.0	14.5	11.5	9.7	4.8	5.0	13.1	21.4	37.8	38.6	7.0	8.4	20.5	14.4	1.9- 2.2
E 5.1-6.0	13.1	20.4	14.1	10.6	8.4	10.0	9.2	12.8	14.3	32.4	30.8	11.3	14.7	2.3- 2.7
D 6.1-7.0	13.3	13.0	8.6	10.2	9.8	6.1	6.2	5.1	4.3	12.6	31.0	17.5	11.6	2.8- 3.1
7.1-8.0	8.6	9.1	7.6	9.1	9.1	7.4	7.7	4.9	3.6	8.7	7.7	9.9	8.1	3.2- 3.6
M 8.1-9.0	5.6	6.1	6.6	7.8	8.9	4.9	7.3	3.3	4.0	6.9	2.5	8.7	6.5	3.7- 4.0
I 9.1-10.0	4.6	6.3	6.6	6.0	6.7	7.8	5.7	2.4	2.1	4.2	1.9	6.3	5.4	4.1- 4.5
L 10.1-11.0	3.9	4.9	5.1	6.2	6.5	7.5	5.8	3.2	2.6	3.8	1.5	4.3	4.8	4.6- 4.9
E 11.1-12.0	4.6	3.1	4.5	4.1	3.2	5.1	5.0	2.9	2.6	3.1	1.2	2.8	3.6	5.0- 5.4
S 12.1-13.0	3.8	2.7	4.3	4.0	4.0	3.7	5.4	2.2	2.9	2.4	1.3	2.9	3.4	5.5- 5.8
/ 13.1-14.0	3.2	2.1	3.5	3.0	5.0	3.4	3.6	1.5	2.1	2.6	1.6	1.8	2.9	5.9- 6.3
H 14.1-15.0	2.7	2.2	3.0	4.2	4.4	2.8	3.0	2.1	2.4	3.0	1.3	2.1	2.9	6.4- 6.7
O 15.1-16.0	2.4	1.9	2.6	3.6	3.2	2.6	2.4	2.2	2.5	2.0	1.2	1.8	2.4	6.8- 7.2
U 16.1-17.0	2.8	1.6	2.7	2.9	2.9	3.2	2.0	1.0	2.4	1.7	1.3	2.2	2.3	7.3- 7.6
R 17.1-18.0	1.7	1.5	2.3	2.6	3.2	2.0	1.9	0.8	1.9	1.7	0.7	1.1	1.9	7.7- 8.0
18.1-19.0	1.0	1.3	2.1	3.5	2.7	2.2	1.3	1.3	0.6	1.9	1.2	1.3	1.8	8.1- 8.5
19.1-20.0	0.9	1.4	1.4	3.1	2.2	1.5	0.4	0.6	1.3	0.7	1.3	0.5	1.4	8.6- 8.9
20.1-25.0	5.7	4.5	8.3	9.7	9.3	7.1	3.4	1.9	1.1	4.0	3.8	2.6	5.6	9.0-11.2
25.1-30.0	1.3	1.4	1.9	2.6	3.4	3.2	0.7	0.4	0.0	0.8	1.2	0.9	1.6	11.3-13.4
30.1-35.0	1.1	0.8	1.2	0.8	1.2	1.7	0.4	0.1	0.0	0.1	0.0	0.9	0.8	13.5-15.6
35.1-40.0	0.2	0.2	0.2	0.2	0.1	0.5	0.0	0.1	0.0	0.0	0.0	0.3	0.2	15.7-17.9
>40.0	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.1	>17.9
AVERAGE SPEED (MPH)	9.3	8.8	10.5	11.6	11.8	10.9	8.6	6.6	6.7	8.4	7.6	8.4	9.4	
AVERAGE SPEED (M/SEC)	4.2	3.9	4.7	5.2	5.3	4.9	3.8	3.0	3.0	3.8	3.4	3.8	4.2	
AVERAGE WIND POWER (WATTS/MM**2)	114.0	96.2	135.6	158.3	161.4	157.0	70.8	42.9	37.0	65.9	58.0	88.8	106.0	
PERCENT DATA RECOVERY	85.5	100.0	97.2	99.9	95.8	90.4	99.9	96.6	100.0	100.0	95.6	93.3	95.9	

ANEMOMETER HEIGHT = 10 METERS = 33 FEET

NUMBER OF OBSERVATIONS = 12589

PERCENTAGE DATA RECOVERY = 95.9

SOURCE: GEORESEARCH, INC.

SPRING CREEK #1

BIG HORN COUNTY

The Spring Creek #1 air monitoring site is located approximately 7 miles north of Decker at 45° 07' 02" N and 106° 52' 32" W (Site No. 5 on Map II-1). Elevation at the site is 3,838 feet. Wind data have been gathered at the Spring Creek Coal Company mine site since January 1, 1981. Data through December 31, 1981, were available for analysis.

The data set contains hourly averages for wind speed and wind direction at an anemometer height of 10 meters. Data recovery for the year was 90.9 percent and was greater than 80.0 percent during all months except November. Although the monitoring period was short, it was adequate to provide a good indication of the wind resource at this location.

Average annual wind speed was 7.3 miles per hour. Monthly average wind speeds were from 4.5 miles per hour in January to 9.9 miles per hour in May. April through June and September through October were the windiest months at this site.

Average monthly wind power ranged from 26.4 watts/m² in January to 107.1 watts/m² in May. Annual average wind power was 56.7 watts/m².

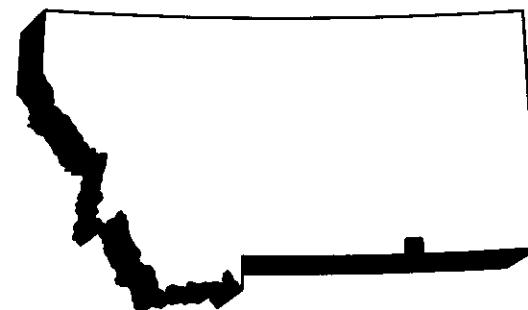


Table IV - 5
Monthly Wind Speed Distribution
BIG HORN COUNTY - SPRING CREEK #1
01/01/81 - 12/31/81

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CALM
0.1-1.0	18.8	7.9	8.1	2.0	0.0	0.0	0.0	0.0	0.0	5.4	5.5	3.9	0.1- 0.4	
1.1-2.0	21.7	18.5	13.6	9.5	2.0	0.2	0.3	0.8	2.5	1.9	6.4	5.7	6.9	0.5- 0.9
S 2.1-3.0	11.4	13.0	9.8	8.0	4.4	2.5	3.8	7.8	9.1	7.6	20.8	18.9	9.2	1.0- 1.3
P 3.1-4.0	8.8	6.7	10.7	7.6	6.8	8.3	10.4	14.0	9.2	15.7	14.4	17.6	10.7	1.4- 1.8
E 4.1-5.0	5.9	5.1	10.7	10.2	7.6	9.4	11.2	11.9	11.1	16.3	9.6	9.6	10.0	1.9- 2.2
E 5.1-6.0	6.9	4.8	7.1	6.9	9.1	12.2	11.2	14.2	11.6	12.1	6.1	8.8	9.4	2.3- 2.7
D 6.1-7.0	5.6	3.7	6.0	6.6	8.5	11.2	10.1	13.7	12.5	7.8	4.8	4.1	8.1	2.8- 3.1
7.1-8.0	2.7	3.4	4.9	6.8	8.0	7.7	10.4	8.5	8.5	6.1	4.2	5.8	6.6	3.2- 3.6
M 8.1-9.0	3.0	5.1	3.9	5.3	6.0	8.2	11.7	6.1	5.0	5.3	3.5	3.6	5.7	3.7- 4.0
I 9.1-10.0	2.6	4.8	3.0	4.7	6.3	6.0	8.8	4.4	5.3	3.1	5.8	3.6	4.8	4.1- 4.5
L 10.1-11.0	2.0	4.6	2.8	5.2	6.6	4.9	5.3	5.0	4.9	2.9	2.2	2.7	4.2	4.6- 4.9
E 11.1-12.0	1.4	3.1	3.0	3.6	5.0	4.0	5.5	3.1	3.6	2.9	3.8	2.5	3.5	5.0- 5.4
S 12.1-13.0	2.3	3.4	3.1	2.6	4.7	3.1	3.4	3.2	3.4	4.4	1.0	2.2	3.2	5.5- 5.8
/ 13.1-14.0	1.9	2.5	2.2	3.7	4.4	4.3	2.6	2.7	2.8	3.8	2.2	1.3	2.9	5.9- 6.3
H 14.1-15.0	1.1	0.9	1.1	2.6	2.5	3.2	2.2	1.1	2.0	2.9	2.2	1.3	1.9	6.4- 6.7
O 15.1-16.0	1.0	1.3	1.4	2.4	2.7	2.5	0.7	0.7	3.1	1.6	1.6	0.8	1.6	6.8- 7.2
U 16.1-17.0	0.6	1.9	1.9	2.7	3.1	3.4	0.7	0.9	1.5	0.7	1.0	1.3	1.6	7.3- 7.6
R 17.1-18.0	0.9	1.3	2.2	1.7	1.6	1.5	0.3	0.7	1.3	1.9	1.0	0.3	1.2	7.7- 8.0
18.1-19.0	0.1	1.3	0.8	1.4	0.6	1.2	0.4	0.3	0.7	0.8	1.3	0.6	0.8	8.1- 8.5
19.1-20.0	0.3	1.5	0.8	2.0	0.9	0.8	0.4	0.1	0.8	0.7	1.6	0.6	0.8	8.6- 8.9
20.1-25.0	1.0	3.9	1.9	3.4	7.4	3.9	0.8	0.7	1.0	1.5	1.3	1.9	2.4	8.9-11.2
25.1-30.0	0.0	0.9	1.1	0.7	1.3	1.4	0.1	0.1	0.0	0.0	0.0	0.8	0.5	11.2-13.4
30.1-35.0	0.0	0.1	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.6	0.1	13.4-15.6
35.1-40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6-17.9
>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	>17.9
AVERAGE SPEED (MPH)	4.5	6.9	6.5	8.2	9.9	9.2	7.7	6.9	7.5	7.2	6.2	6.1	7.3	
AVERAGE SPEED (M/SEC)	2.0	3.1	2.9	3.7	4.4	4.1	3.4	3.1	3.4	3.2	2.8	2.7	3.2	
AVERAGE WIND POWER (WATTS/MM**2)	26.4	73.4	57.3	78.3	107.1	84.2	38.7	32.5	45.1	45.7	41.8	54.1	56.7	
PERCENT DATA RECOVERY	93.5	99.7	99.1	96.7	85.3	90.1	99.7	99.7	99.2	98.7	43.5	85.5	90.9	

ANEMOMETER HEIGHT = 10 METERS = 33 FEET

NUMBER OF OBSERVATIONS = 7964

PERCENTAGE DATA RECOVERY = 90.9

SOURCE: GEORESEARCH, INC.

WESTMORELAND ABSALOKA #2

BIG HORN COUNTY

The Absaloka #2 air monitoring site is located approximately 30 miles east of Hardin at 45° 46' 27" N and 107° 04' 57" W (Site No. 6 on Map II-1). Elevation at the site is 3,539 feet. The site was established by Westmoreland Resources to monitor particulate concentrations in the air around the Absaloka mine.

Wind data have been gathered at this site since August 1, 1980. Data through March 29, 1982, were available for analysis. The data set contains hourly averages for wind speed and wind direction, which were reduced from stripchart records. Anemometer height was 10 meters. Data recovery was excellent, ranging from 96.9 percent in October to 100.0 percent during several months. Overall, 99.3 percent of the available data were recovered.

Average annual wind speed was 6.3 miles per hour. Monthly average wind speed ranged from 5.5 miles per hour in December to 7.8 miles per hour in April. The windiest months were April through June.

Average monthly wind power varied from 18.9 watts/m² in November to 43.2 watts/m² in April. Annual average wind power was 25.8 watts/m².

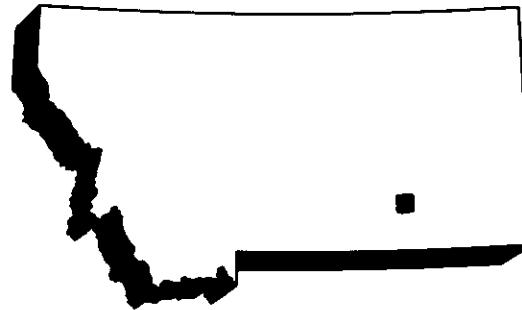


Table IV - 6
Monthly Wind Speed Distribution
BIG HORN COUNTY - WESTMORELAND ABSALOKA #2
08/01/80 - 03/29/82

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
CALM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	CALM
0.1-1.0	0.0	0.1	0.4	0.0	0.5	0.0	0.9	0.7	0.4	0.0	0.0	0.9	0.3	0.1- 0.4
1.1-2.0	3.0	3.0	3.6	0.8	0.9	1.3	3.9	5.1	3.8	2.6	2.4	5.3	3.2	0.5- 0.9
2.1-3.0	11.0	8.8	10.9	6.5	6.1	5.0	8.6	9.0	7.9	9.2	8.8	13.9	9.3	1.0- 1.3
3.1-4.0	18.3	13.2	14.3	8.9	12.1	8.3	11.0	9.9	11.3	12.1	17.0	17.6	13.4	1.4- 1.8
4.1-5.0	18.6	15.3	12.1	11.4	12.4	11.4	12.8	11.3	12.0	14.8	19.7	16.0	14.4	1.9- 2.2
5.1-6.0	14.6	13.0	11.3	9.9	10.6	12.9	16.7	14.4	12.9	12.6	15.2	12.6	13.2	2.3- 2.7
6.1-7.0	10.5	12.6	10.7	11.9	10.8	13.2	11.3	13.0	10.9	12.8	12.1	7.5	11.4	2.8- 3.1
7.1-8.0	5.7	8.9	9.5	9.4	8.5	10.7	11.7	10.6	12.4	10.5	6.7	6.7	9.1	3.2- 3.6
8.1-9.0	5.7	6.3	8.1	6.9	6.2	10.3	7.4	7.6	7.8	6.4	6.1	5.1	6.8	3.7- 4.0
9.1-10.0	3.6	5.7	5.2	6.5	5.7	5.7	4.3	6.9	5.5	5.5	3.6	3.6	5.0	4.1- 4.5
10.1-11.0	1.7	3.8	3.6	7.1	7.3	6.4	4.7	4.0	4.1	4.4	2.6	3.4	4.0	4.6- 4.9
11.1-12.0	1.6	2.5	2.7	4.4	5.5	4.7	2.6	2.5	3.4	2.8	1.9	1.7	2.8	5.0- 5.4
12.1-13.0	1.3	2.1	2.1	5.7	3.4	3.5	1.6	2.3	3.1	1.5	1.0	1.6	2.2	5.5- 5.8
13.1-14.0	1.2	1.8	2.4	2.8	3.2	1.8	1.2	0.9	1.5	1.5	0.9	1.2	1.6	5.9- 6.3
14.1-15.0	1.3	1.1	1.1	2.5	1.9	1.4	0.5	0.7	1.0	0.8	0.7	0.9	1.1	6.4- 6.7
15.1-16.0	0.3	0.7	0.7	1.4	1.2	1.0	0.3	0.2	0.7	1.0	0.2	0.7	0.6	6.8- 7.2
16.1-17.0	0.4	0.6	0.3	1.5	1.2	0.3	0.0	0.1	0.6	0.4	0.3	0.4	0.5	7.3- 7.6
17.1-18.0	0.3	0.2	0.2	1.0	0.7	0.7	0.1	0.3	0.3	0.2	0.1	0.3	0.3	7.7- 8.0
18.1-19.0	0.6	0.0	0.3	0.6	0.3	1.3	0.1	0.2	0.1	0.1	0.1	0.3	0.3	8.1- 8.5
19.1-20.0	0.1	0.1	0.1	0.6	0.5	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.2	8.6- 8.9
20.1-25.0	0.3	0.0	0.7	0.1	1.1	0.0	0.1	0.2	0.1	0.8	0.2	0.2	0.3	9.0-11.2
25.1-30.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3-13.4
30.1-35.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5-15.6
35.1-40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.7-17.9
>40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	>17.9
AVERAGE SPEED (MPH)	5.7	6.3	6.4	7.8	7.5	7.4	6.1	6.3	6.6	6.4	5.7	5.5	6.3	
AVERAGE SPEED (M/SEC)	2.6	2.8	2.8	3.5	3.4	3.3	2.7	2.8	2.9	2.9	2.6	2.5	2.8	
AVERAGE WIND POWER (WATTS/M**2)	23.2	24.3	28.4	43.2	41.1	34.2	19.9	21.9	25.8	26.9	18.9	20.9	25.8	
PERCENT DATA RECOVERY	100.0	100.0	99.1	100.0	99.9	100.0	100.0	97.9	99.2	96.9	99.7	100.0	99.3	

ANEMOMETER HEIGHT = 10 METERS = 33 FEET^V

NUMBER OF OBSERVATIONS = 14438

PERCENTAGE DATA RECOVERY = 99.3

SOURCE: GEORESEARCH, INC.